

Reptiles, Squamata, Parque Natural Municipal da Taquara, municipality of Duque de Caxias, state of Rio de Janeiro, Southeastern Brazil

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ABSTRACT: Herein we report a list of the reptiles from Parque Natural Municipal da Taquara, municipality of Duque de Caxias, state of Rio de Janeiro, southeastern Brazil, an area situated in the Atlantic Rainforest Domain. The study was carried out from September 2006 to October 2008. We recorded 31 species of Squamate reptiles: one species of the family Amphisbaenidae; eight species of lizards of the families Anguidae (n = 1), Gekkonidae (1), Phyllodactylidae (1), Polychrotidae (1), Scincidae (1), Teiidae (2), and Tropiduridae (1); and 22 species of snakes of the families Boidae (2), Colubridae (6), Dipsadidae (11), Elapidae (1), and Viperidae (2). Our study indicates that the PNMT is an important area for the conservation of the Squamate reptile assemblages that inhabit lowlands of Atlantic Rainforest in Brazil.

INTRODUCTION

The Atlantic Rainforest is a complex environment that detains one of the world's biggest animal diversities, showing high level of species endemism (Myers *et al.* 2000). Currently, the remaining area is restricted to *ca.* 16,377,472 ha, that represents 11.73 % of its original extension (Ribeiro *et al.* 2009). These fragments are under enormous anthropogenic action and subject to a strong risk of extinction (Morellato and Haddad 2000). The fragmentation of the Atlantic Rainforest has been subject of many recent studies (Brown and Freitas 2000; Machado and Fonseca 2000; Strier 2000; Tabanez and Viana 2000). Most of them agree that even these remnants still detain a large diversity of species and efforts for its conservation have been made.

The Brazilian reptiles have also been subject of several studies on reptile populations/inventories in the past decades (*e.g.* Araújo 1981; Araújo 1991; Freire 1996; Teixeira 2001; Teixeira-Filho *et al.* 2001; Marques *et al.* 2004; Marques and Sazima 2004; Rocha *et al.* 2004a; b; Carvalho *et al.* 2007; Cicchi *et al.* 2007). Nonetheless, studies on zoogeography, conservation status, ecological behavior and taxonomy of squamate species still lack much information.

In order to provide additional data on the composition of species of squamate reptiles for the Atlantic Rainforest lowland, we present the results of two years of field work at the Parque Natural Municipal de Taquara.

MATERIALS AND METHODS

Study site

The study area includes the Parque Natural Municipal da Taquara (PNMT; 22°35' S, 43°14' W) and its surroundings, in the municipality of Duque de Caxias, state of Rio de Janeiro, southeastern Brazil (Figure 1). The PNMT is a conservation area that belongs to the Instituto

Nacional de Colonização e Reforma Agrária (INCRA) since 1992 and is probably the most important forested area of that municipality. It is situated in a lowland portion of the Atlantic Rainforest Domain (Ab'Sáber 1977), in the Serra do Mar complex, with approximately 20,1 ha and altitudes under 100 m (above sea level). The native vegetation is classified as Ombrophilous Forest, found in subtropical to tropical portions of the Atlantic Rainforest (Rizini 1979; Fernandes 1998).

Data collection

The fieldwork was carried out from September 2006 to October 2008, three times a week during the day, and once a month during the night.

Specimens were captured by active-searching method (Franco *et al.* 2002) (flashlights were used at night), and handled with leather gloves, hooks and slingshots. They

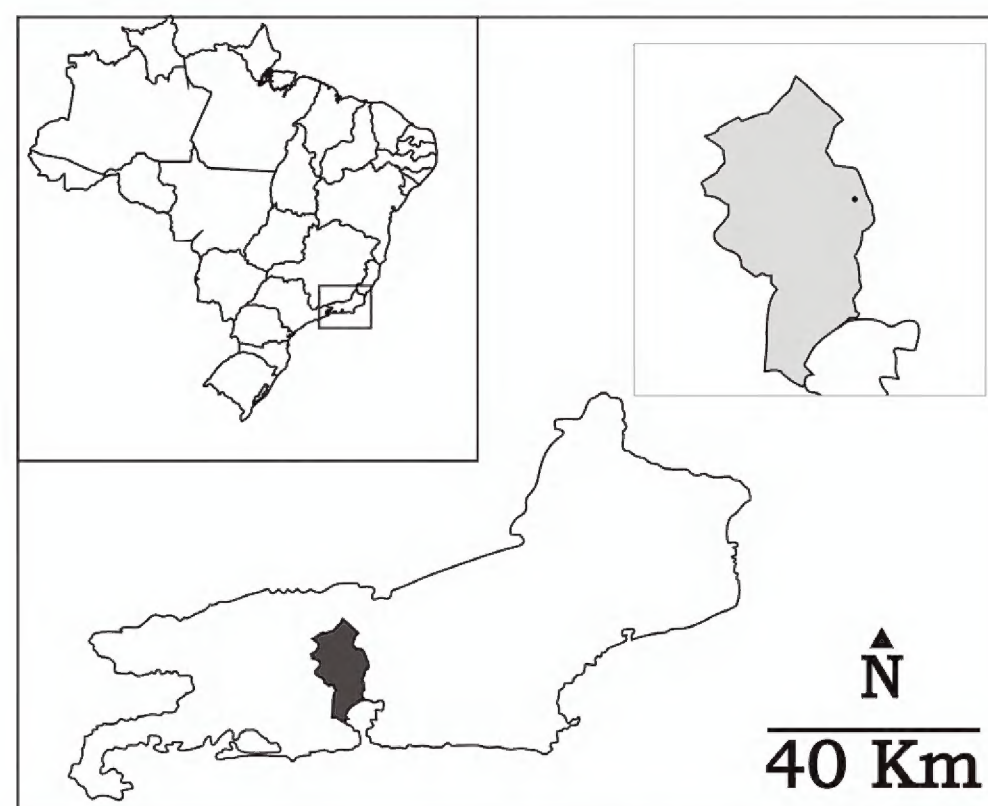


FIGURE 1. Municipality of Duque de Caxias (gray); Parque Natural Municipal de Taquara (dot).

were preserved using the usual techniques proposed by Pisani and Villa (1974).

The voucher specimens are housed at the reptile collection of Museu Nacional, Universidade Federal do Rio de Janeiro (MNRJ), Rio de Janeiro, Brazil, (Appendix 1). Collection permits were issued by the Instituto Brasileiro do Meio Ambiente e Recursos Naturais Renováveis (IBAMA; permit #17914-2, process 21619-1).

RESULTS AND DISCUSSION

Thirty-one species of Squamate reptiles were found in total, being 22 species of snakes distributed in the families Boidae (2), Colubridae (6), Dipsadidae (11), Elapidae (1) and Viperidae (2); eight species of lizards distributed in the families Anguidae (1), Gekkonidae (1), Phyllodactylidae (1), Polychrotidae (1), Scincidae (1), Teiidae (2), and Tropiduridae (1); and one species of amphisbaenian of the family Amphisbaenidae (Table 1; Figures 2-5).

According to Rocha et al. (2004a; b), in the state of Rio de Janeiro there are 127 species of Squamate reptiles. The species recorded at PNMT, when compared with the number of reptiles found in the state of Rio de Janeiro, stands approximately for 25.6 % of the snakes, 32.14 % of the lizards and 14.8 % of the amphisbaenians.

Comparing our results to other studied areas (Table 2), it is noteworthy that the number of species found at PNMT is not much different comparable to the number of species reported for other larger localities of the Atlantic Rainforest (e.g. Marques and Sazima 2004; Pontes et al. 2008; Santana et al. 2008; Bertoluci et al. 2009).

The number of snakes found at PNMT is smaller than the number of species found in the Serra do Mendanha (Pontes and Rocha 2008 and Pontes et al. 2008), which also belongs to Serra do Mar. Despite having a larger area (ca. 8.500 ha) and being located nearly 32.5 km straight-line distant from PNMT, the number of species of snake found in Serra do Mendanha (N = 27) is almost similar to the number found in our study site (N = 22). Moreover, we found three species which were not recorded by Pontes and Rocha (2008) at Serra do Mendanha: *Corallus hortulanus*, *Liophis reginae*, and *Sibynomorphus neuwiedi*.

Concerning the conservation status, none of the species found is included in IBAMA's Red List or IUCN (2007).

The species *Corallus hortulanus* and *Boa constrictor* were recorded for the area but not collected. The specimens were photographed in the site and released (Figure 3A). The specific level of *Thamnodynastes* sp. could not be reached. The same species is cited by Franco and Ferreira (2002) and Marques et al. (2004) as *Thamnodynastes* sp1., and probably refers to a new species.

The lizard *Hemidactylus mabouia*, a species introduced in Brazil by slavery ships from Africa (Vanzolini 1978), is completely adapted in PNMT's environment, but always encountered associated with human buildings. Specimens of the lizard *Gymnodactylus darwinii* were found inside the forest and nearby built structures as well. Differently of the results obtained by Teixeira (2002), which studied

the coexistence of *G. darwinii* and *H. mabouia* in Pontal do Ipiranga, municipality of Linhares, state of Espírito Santo, both species apparently do not occur syntopically at PNMT.

The present study indicates Parque Natural Municipal da Taquara as a Conservation Unity of great diversity in Squamate reptiles, despite its restricted area. Thus, the conservation of this area and its vicinity turns out to be of high importance to preserve the species that inhabit the lowlands of the Atlantic Rainforest.

TABLE 1. Squamate reptile species from Parque Natural Municipal da Taquara, municipality of Duque de Caxias, state of Rio de Janeiro, southeastern Brazil.

| |
|--|
| Amphisbaenidae Gray, 1825 |
| <i>Amphisbaena microcephala</i> (Wagler, 1824) |
| Anguidae Oppel, 1811 |
| <i>Ophiodes striatus</i> (Spix, 1824) |
| Gekkonidae Gray, 1827 |
| <i>Hemidactylus mabouia</i> (Moreau-de-Jonnès, 1818) |
| Phyllodactylidae Gamble, Bauer, Greenbaum and Jackman, 2008 |
| <i>Gymnodactylus darwinii</i> (Gray, 1845) |
| Polychrotidae Fitzinger, 1843 |
| <i>Anolis punctatus</i> (Daudin, 1802) |
| Scincidae Gray, 1825 |
| <i>Mabuya agilis</i> (Raddi, 1823) |
| Teiidae Gray, 1827 |
| <i>Ameiva ameiva</i> (Linnaeus, 1758) |
| <i>Tupinambis merianae</i> (Duméril & Bibron, 1839) |
| Tropiduridae Bell 1843 |
| <i>Tropidurus torquatus</i> (Wied-Neuwied, 1820) |
| Boidae Gray, 1825 |
| <i>Boa constrictor</i> (Linnaeus, 1758) |
| <i>Corallus hortulanus</i> (Linnaeus, 1758) |
| Colubridae Oppel, 1811 |
| <i>Chironius bicarinatus</i> (Wied-Neuwied, 1820) |
| <i>Chironius exoletus</i> (Linnaeus, 1758) |
| <i>Chironius fuscus</i> (Linnaeus, 1758) |
| <i>Leptophis ahaetulla</i> (Linnaeus, 1758) |
| <i>Pseustes sulphureus</i> (Wagler, 1824) |
| <i>Spilotes pullatus</i> (Linnaeus, 1758) |
| Dipsadidae Bonaparte, 1838 |
| <i>Echinanthera cephalostriata</i> Di-Bernardo, 1996 |
| <i>Elapomorphus quinquelineatus</i> (Raddi, 1820) |
| <i>Leptodeira annulata</i> (Linnaeus, 1758) |
| <i>Liophis miliaris</i> (Linnaeus, 1758) |
| <i>Liophis reginae</i> (Linnaeus, 1758) |
| <i>Oxyrhopus petola</i> (Linnaeus, 1758) |
| <i>Philodryas olfersii</i> (Lichtenstein, 1823) |
| <i>Sibynomorphus neuwiedi</i> (Ihering, 1911) |
| <i>Siphlophis compressus</i> (Daudin, 1803) |
| <i>Thamnodynastes</i> sp. |
| <i>Xenodon neuwiedii</i> (Günther, 1863) |
| Elapidae Boie, 1827 |
| <i>Micrurus corallinus</i> (Merrem, 1820) |
| Viperidae Laurenti, 1768 |
| <i>Bothropoides jararaca</i> (Wied-Neuwied, 1824) |
| <i>Bothrops jararacussu</i> Lacerda, 1884 |



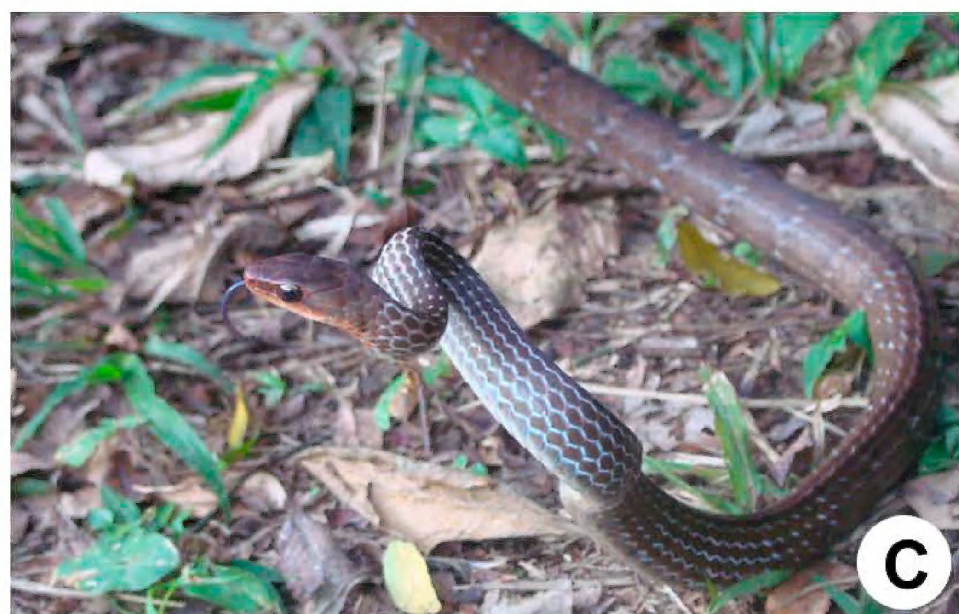
FIGURE 2. Specimens from Parque Natural Municipal da Taquara: A - *Amphisbaena microcephala*; B - *Ophiodes striatus*; C - *Gymnodactylus darwini*; D - *Hemidactylus mabouia*; E - *Mabuya agilis*; F - *Ameiva ameiva*; G - *Tupinambis meiriana*; H - *Tropidurus torquatus*.



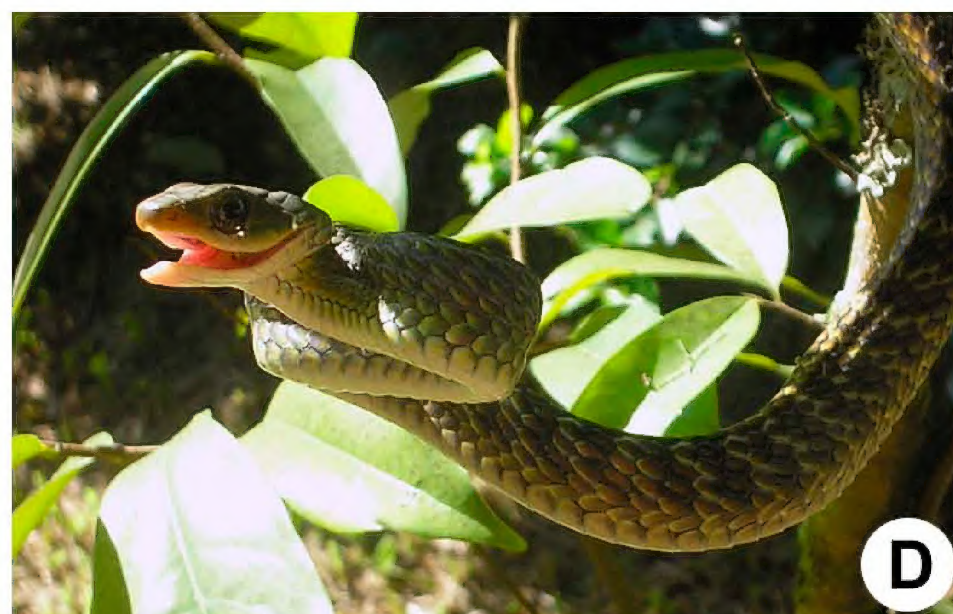
A



B



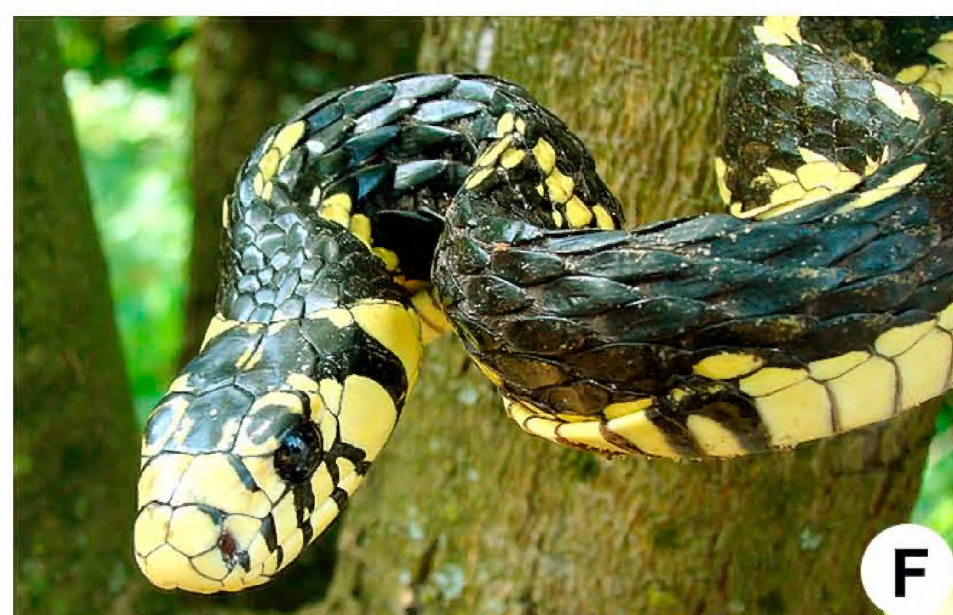
C



D



E



F



G



H

FIGURE 3. Specimens from Parque Natural Municipal da Taquara: A - *Boa constrictor*; B - *Chironius bicarinatus*; C - *Chironius fuscus*; D - *Chironius exoletus*; E - *Pseustes sulphureus*; F - *Spilotes pullatus*; G - *Echinanthera cephalostriata*; H - *Elapomorphus quinquelineatus*.



FIGURE 4. Specimens from Parque Natural Municipal da Taquara: A - *Liophis miliaris*; B - *Liophis reginae*; C - *Leptodeira annulata*; D - *Oxyrhopus petola*; E - *Sibynomorphus neuwiedii*; F - *Siphlophis compressus*; G - *Thamnodynastes* sp.; H - *Xenodon neuwiedii*.



FIGURE 5. Specimens from Parque Natural Municipal da Taquara: A - *Micrurus corallinus*; B - *Bothropoides jararaca*; C - *Bothrops jararacussu*.

TABLE 2. Reptile richness, time sampled, and size of some areas where other reptile inventories were conducted in the Atlantic Rainforest of Brazil. Abbreviations and sources: APA-MB = Área de Proteção Permanente Mata do Buraquinho, PB; EPDAP = Estação de Pesquisa e Desenvolvimento Ambiental de Peti, São Gonçalo do Rio Abaixo and Santa Bárbara, MG; EEJ-Itatins = Estação Ecológica Juréia-Itatins, Peruíbe, Iguape, Itariri and Miracatu, SP; RFMG = Reserva Florestal de Morro Grande, Cotia, SP; PASP = Planalto Atlântico de São Paulo, Tapiraí and Piedade, SP; CISSP = Coastal islands of State of São Paulo, SP; SJ = Serra do Japi, Jundiaí, SP; IM = Ilha de Marambaia, Mangaratiba, RJ; IG = Ilha Grande, Angra dos Reis, RJ; SM = Serra do Mendanha, Rio de Janeiro, RJ.

| PLACE | STATE | TIME SAMPLED | AREA (HA) | N SNAKES | N LIZARDS | N AMPHISBAENIAS | N TOTAL SPECIES | REFERENCES |
|-------------|-------|--------------|-----------|----------|-----------|-----------------|-----------------|------------------------------|
| APA-MB | PB | > 1 year | 515 | 18 | 13 | 2 | 33 | Santana <i>et al.</i> 2008 |
| EPDA-Peti | MG | > 3 years | 606 | 21 | 6 | 1 | 28 | Bertoluci <i>et al.</i> 2009 |
| EEJ-Itatins | SP | 4 years | 79230 | 25 | 7 | 2 | 34 | Marques and Sazima 2004 |
| RFMG | SP | > 1 year | 10870 | 3 | 5 | - | 8 | Dixo and Verdade 2006 |
| PASP | SP | >2 years | 26250 | 46 | 8 | 1 | 55 | Condez <i>et al.</i> 2009 |
| CISSP | SP | 5 years | - | 36 | - | - | 36 | Cicchi <i>et al.</i> 2007 |
| SJ | SP | - | 35000 | 13 | 5 | 1 | 19 | Sazima and Haddad 1992 |
| IM | RJ | 1 year | 4000 | - | 12 | - | 12 | Carvalho <i>et al.</i> 2007 |
| IG | RJ | > 1 year | 19300 | 16 | 8 | 1 | 25 | Rocha and Van-Sluys 2006 |
| SM | RJ | 4 years | 8500 | 27 | - | - | 27 | Pontes <i>et al.</i> 2008 |
| PNMT | RJ | 2 years | 20,14 | 21 | 8 | 1 | 30 | this study |

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APPENDIX 1. Examined material

Amphisbaenidae: *Amphisbaena microcephala* (MNRJ 15421, 15615, 16896, 17059, 17484); **Anguidae**: *Ophiodes striatus* (MNRJ 15792, 15425, 15426, 15564); **Gekkonidae**: *Hemidactylus mabouia* (MNRJ 15445, 15446, 15447, 17008, 17009, 17010); **Scincidae**: *Mabuya agilis* (MNRJ 15448, 16129); **Phyllodactylidae**: *Gymnodactylus darwini* (MNRJ 15449, 15795, 15796, 17535); **Polychrotidae**: *Anolis punctatus* (MNRJ 17005); **Teiidae**: *Ameiva ameiva* (MNRJ 15791), *Tupinambis merianae* (MNRJ 17696); **Tropiduridae**: *Tropidurus torquatus* (MNRJ 15789, 15790, 16894, 16898); **Colubridae**: *Chironius bicarinatus* (MNRJ 15614, 16034, 16110, 16530, 16897), *Chironius exoletus* (MNRJ 17831, 18181), *Chironius fuscus* (MNRJ 15331, 17667), *Leptophis ahaetulla* (MNRJ 15424), *Pseustes sulphureus* (MNRJ 16132, 17870), *Spilotes pullatus* (MNRJ 15975, 17495, 17871); **Dipsadidae**: *Echianthera cephalostriata* (MNRJ, 15420, 15595, 16122, 16363, 16529), *Elapomorphus quinquelineatus* (MNRJ 16422), *Leptodeira annulata* (MNRJ 15593, 15594, 16532, 16895, 17483, 17508, 17666, 17832), *Liophis miliaris* (MNRJ 15794, 15797, 16362, 16419, 16420, 16421, 16536, 17004, 17521, 17874), *Liophis reginae* (MNRJ 15793, 15761), *Oxyrhopus petola* (MNRJ 15390, 15616, 15566, 16027), *Philodryas olfersii* (MNRJ 15588, 17330), *Sibynomorphus neuwiedi* (MNRJ 15592, 16538), *Siphlophis compressus* (MNRJ 15589, 17507), *Thamnodynastes* sp. (MNRJ 15798, 15810, 16125), *Xenodon neuwiedii* (MNRJ 15590, 15591, 15596, 16130, 17006, 17928); **Elapidae**: *Micrurus corallinus* (MNRJ 15944, 15945, 15946, 15947, 15948, 16537, 17838, 17839); **Viperidae**: *Bothropoides jararaca* (MNRJ 16452, 16586, 16587, 17873), *Bothrops jararacussu* (MNRJ 15376, 15563, 16131).